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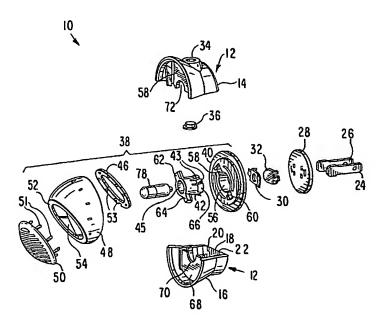
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

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(54) Title: NIGHTLIGHT, LED POWER SUPPLY CIRCUIT, AND CONBINATION THEREOF



(57) Abstract: A nightlight (10) having a light sensor (36) to activate lamp (78) in response to the ambient light, a cover member (38) including a lens (50), and a lamp support member (42) non-rotatably coupled to the cover member (38). A night base member (12) includes blade contacts (24, 26) for insertion into an electrical receptacle. T lamp support (42) is rotatably coupled to the base member (12), such that rotation of the cover member (38) redirects the light emitted by the lamp (78) through the lens (50). The lamp (78) could be a light emitting diode "LED".



## INTERNATIONAL SEARCH REPORT

International application No.

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According to International Patent Classification (IPC) or to both national classification and IPC  B. FIELDS SEARCHED  Minimum documentation searched (classification system followed by classification symbols)  U.S.: 362/276, 227, 235, 236, 257, 277, 282, 285, 362, 372, 800, 802  Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched NONE  Blectronic data base consulted during the international search (name of data base and, where practicable, search terms used)  USPTO APS EAST  C. DOCUMENTS CONSIDERED TO BE RELEVANT  Category * Citiation of document, with indication, where appropriate, of the relevant passages Relevant to claim No.  X		SIFICATION OF SUBJECT MATTER		
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## INTERNATIONAL SEARCH REPORT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X - Y	US 4,611,266 A (SCHWARTZ) 09 September 1986 (09.09.1986), see entire document.	1-17, 24  25
x 	US 4,343,032 A (SCHWARTZ) 03 August 1982 (03.08.1982), see entire document.	1-17, 24
Y		25
<u>х</u>  Y	US 3,801,814 A (ARTS) 02 April 1974 (02.04.1974), see entire document.	1-17, 24
x 	US 5,655,830 A (RUSKOUSKI) 12 August 1997 (12.08.1997), Figures 2 and 5.	18-20
Y		24, 25
x	US 5,688,042 A (MADADI et al) 18 November 1997 (18.11.1997), Figure 9.	21-23
x	US 6,388,393 B1 (ILLINGWORTH) 14 May 2002 (14.05.2002), see entire document.	26